CSC 101 - INTRODUCTION TO COMPUTING SCIENCES

Osun State University, Osogbo.

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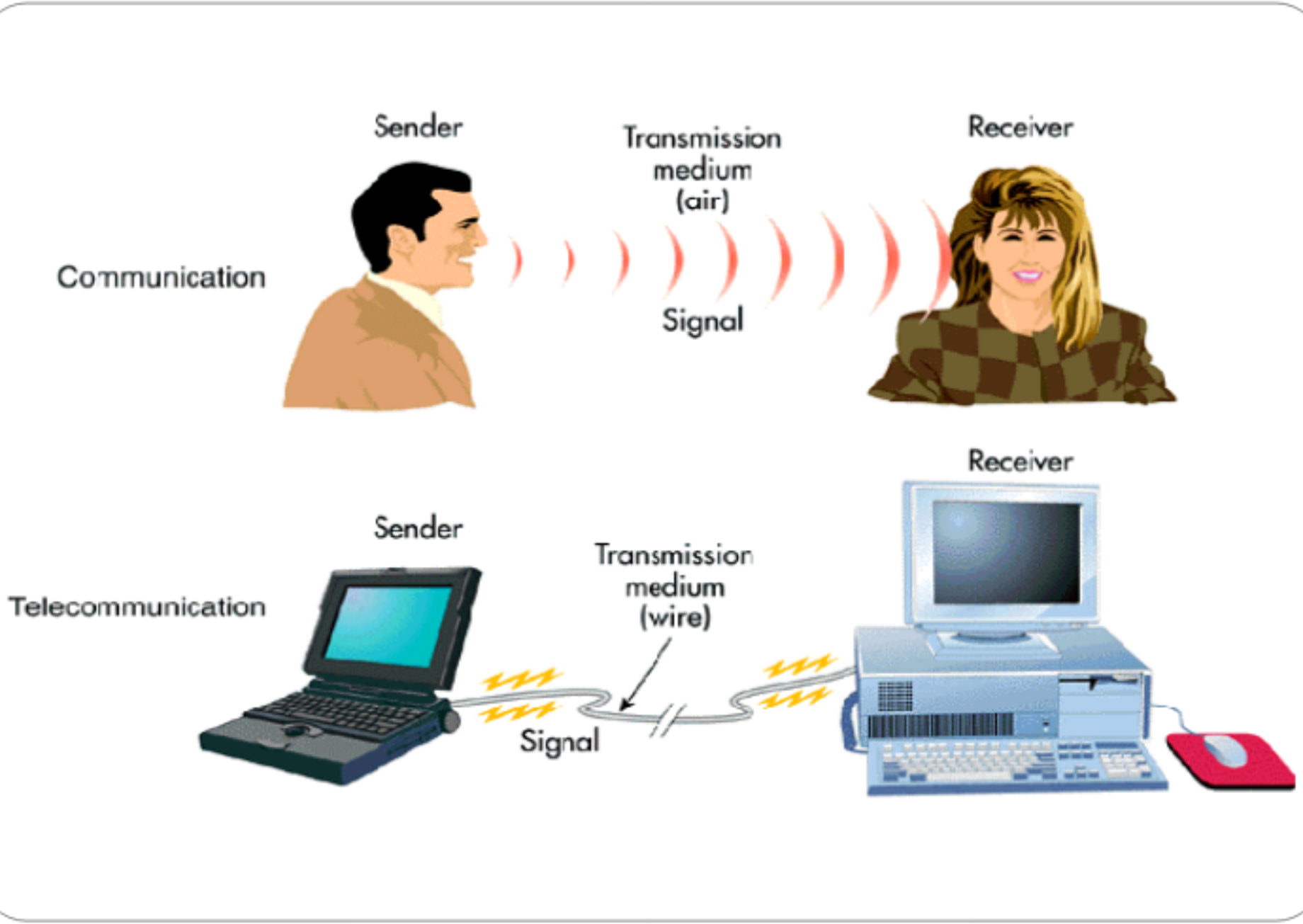
The Internet, its applications and its impact on the world today.

INTRODUCTION

- Communication : When we communicate, we are sharing Information.
- This sharing can be local or remote
- Local Communication – Face to face
- Remote Communication- takes place over distance
- Telecommunication-means communication at a distance (tele is Greek for far)
- Data : refers to information presented in whatever form as agreed by the parties creating and using the data. Data is all kinds of facts, including, pictures, letters, numbers, and sounds.

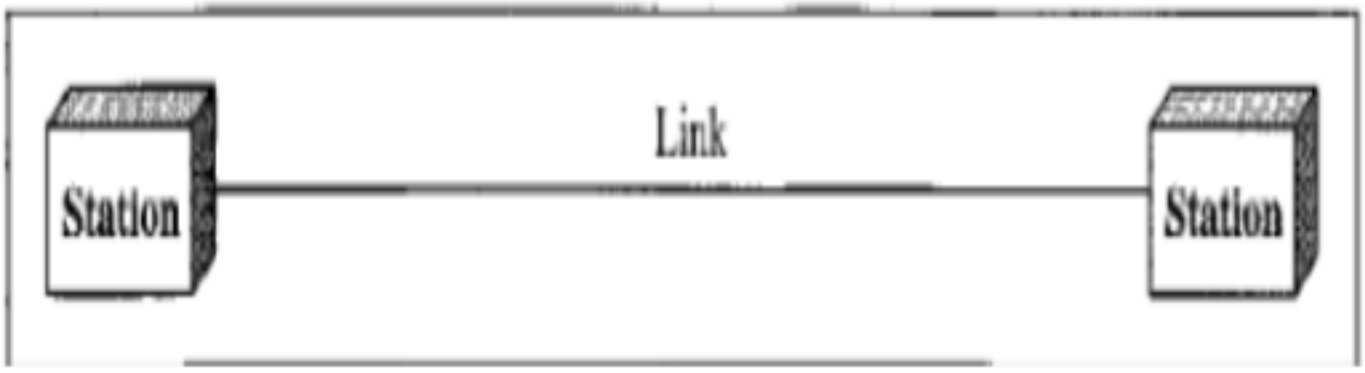

Sender
Transmission medium (air)
Receiver
Communication
Signal
Receiver
Sender
Transmission medium (wire)
Telecommunication
Signal

NETWORK

- Network is a set of devices (often referred to as nodes) connected by communication links.
- A node can be a computer, printer or any other device capable of sending or receiving data generated .
- Most networks use distributed processing in which a task is divided among multiple computers.
- A network must be able to meet certain criteria; the most important of these are performance, reliability and security.

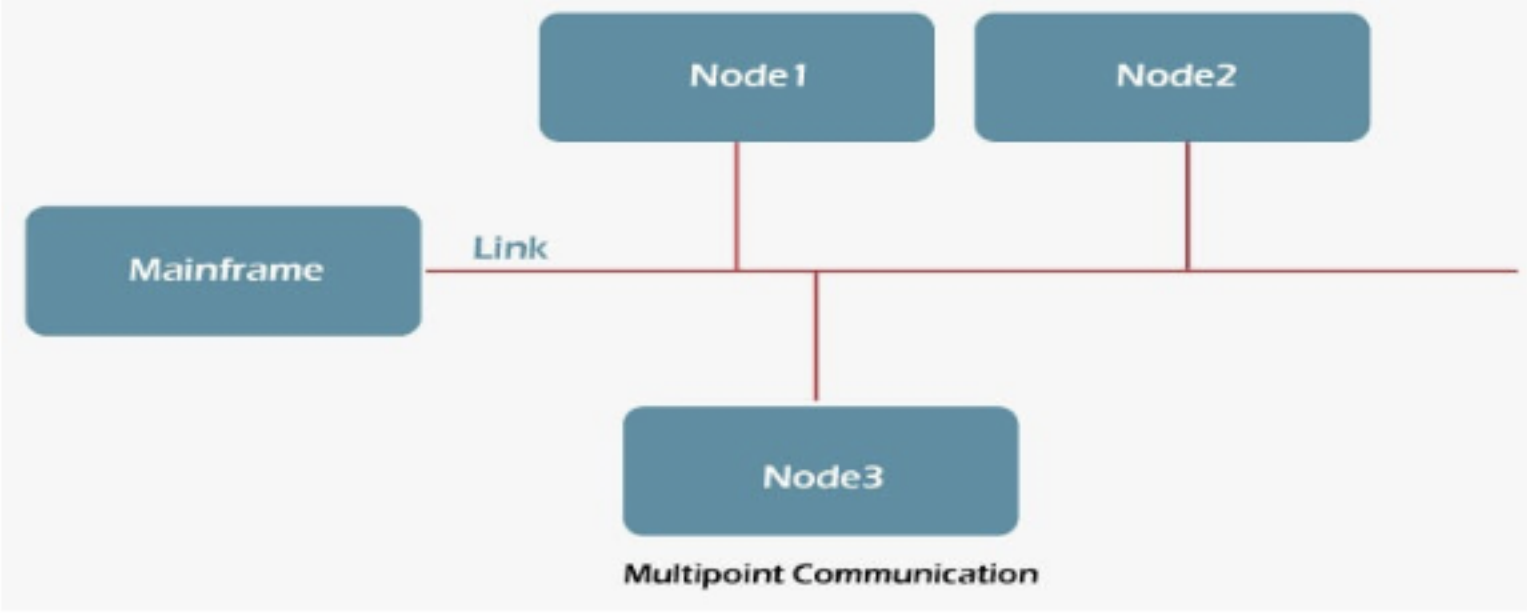
POINT-TO-POINT CONNECTION

- A type of connection provides a dedicated link between two devices .
- The entire capacity of the link is reserved for transmission between those two devices.
- Most point-to point connection use an actual length of wire or cable to connect two ends.



MULTIPOINT CONNECTION

- A multipoint connection is one that connects more than two devices together.
- The capacity of the channel is temporarily divided among the devices connecting to the link.



TYPES OF NETWORKS

- LANs (Local Area Networks),
- PANs (Personal Area Networks),
- WANs (Wide Area Networks),
- MANs (Metropolitan Area Networks) etc.

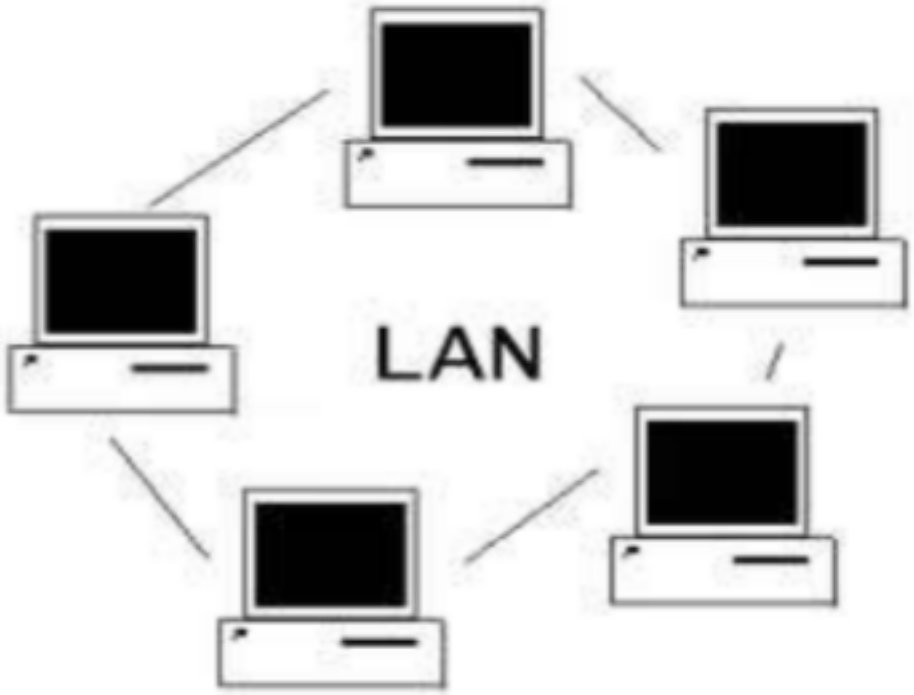
LANs (Local Area Networks)

- A LAN is a network that is used for communicating among computer devices, usually within an office building or home.
- LAN's enable the sharing of resources such as files or hardware devices that may be needed by multiple users.
- Is limited in size, typically spanning a few hundred meters, and no more than a mile.
- Is fast, with speeds from 10 Mbps to 10 Gbps
- Requires little wiring, typically a single cable connecting to each device

LANs (Local Area Networks)

- Has lower cost compared to MAN's or WAN's
- LAN's can be either wired or wireless. Twisted pair, fibre optic cable can be used in wired LAN's.
- Every LAN uses a protocol – a set of rules that governs how packets are configured and transmitted..
- Nodes in a LAN are linked together with a certain topology.

LANs (Local Area Networks)



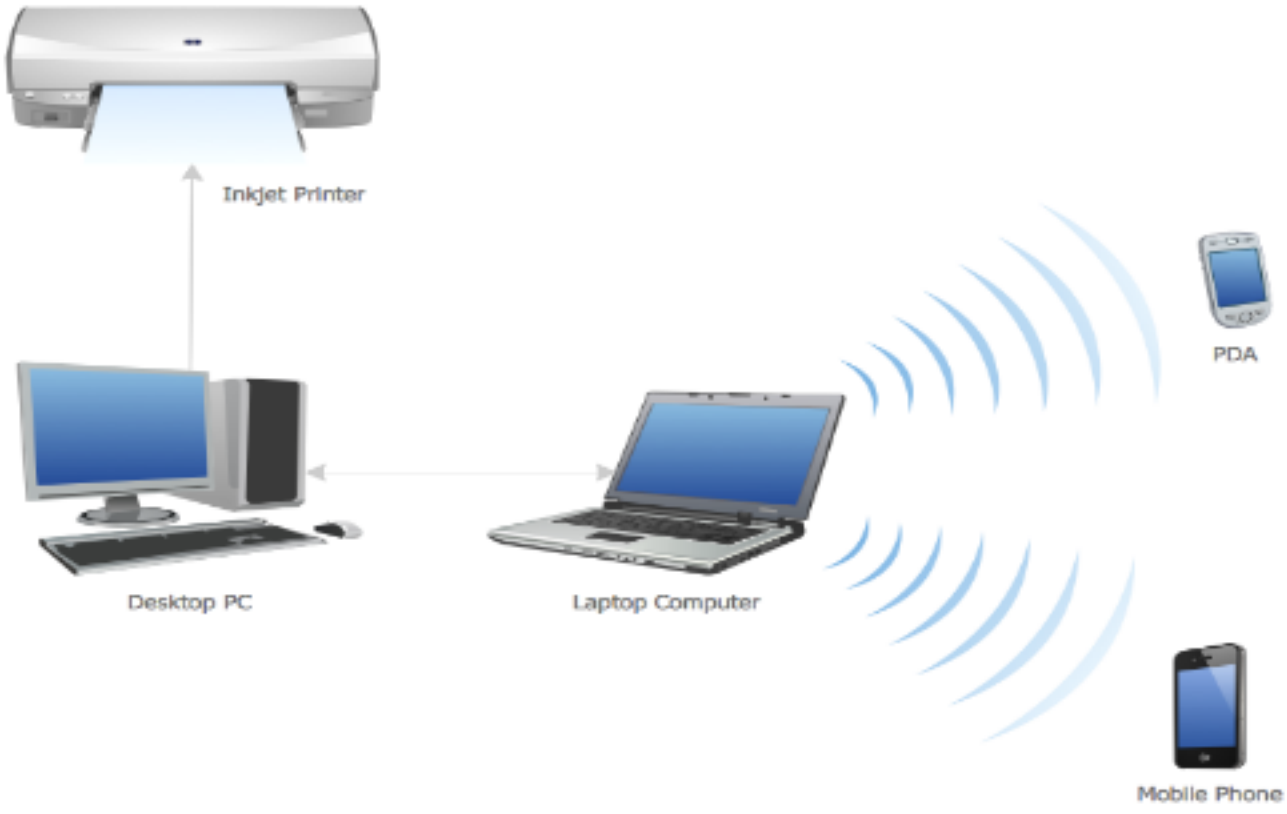
LANs (Local Area Networks)

- **Advantages**
  - Speed, Security, and Resource Sharing
- **Disadvantages**
  - Expensive To Install
  - Requires Administrative Time
  - File Server May Fail
  - Cables May Break

Personal Area Network (PAN)

- A PAN is a network that is used for communicating among computers and computer devices (including telephones) in close proximity of around a few meters within a room.
- It can be used for communicating between the devices themselves

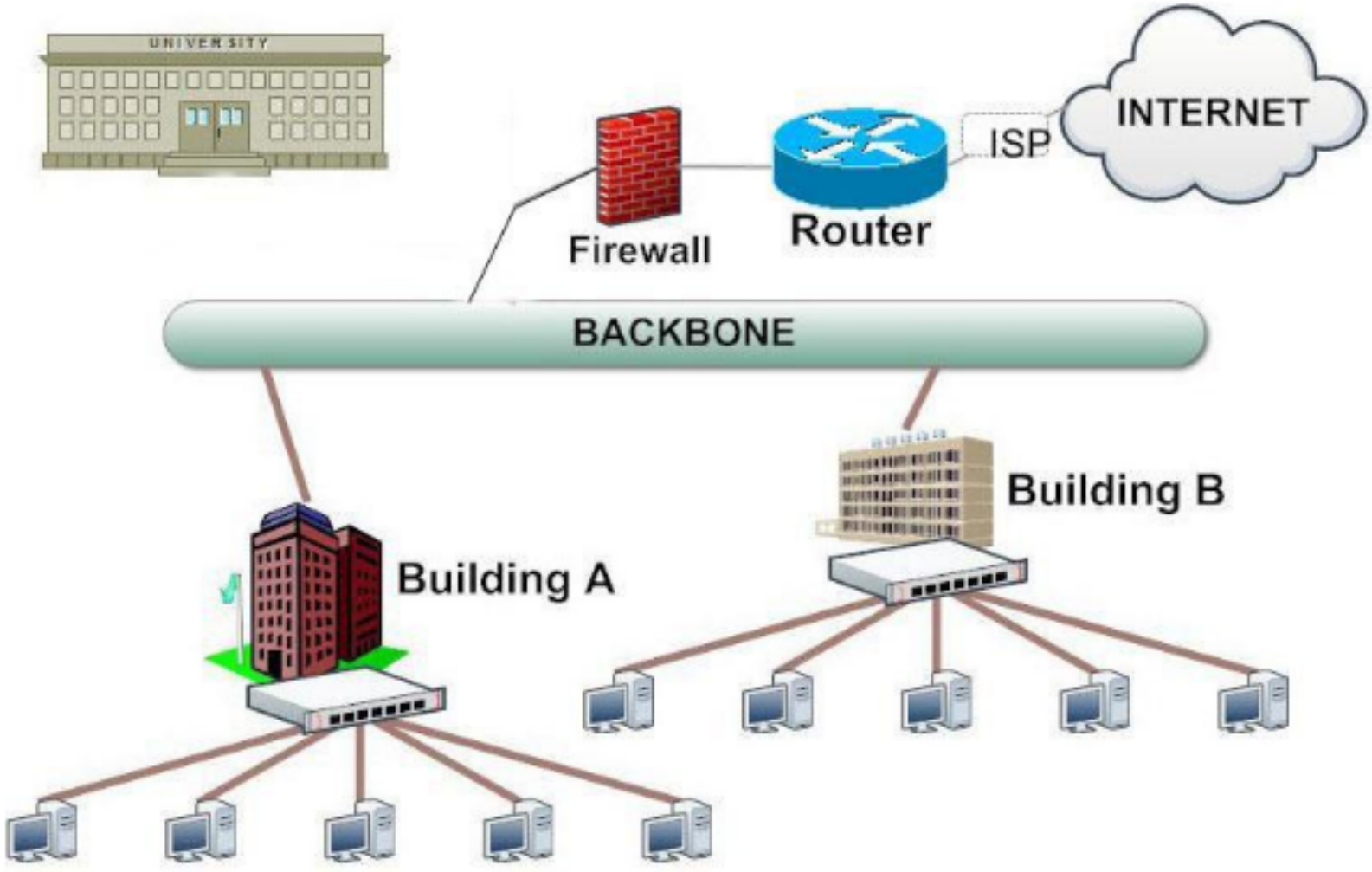
Personal Area Network (PAN)



CANs (Campus Area Networks)

- A Campus Area Network (CAN) is a computer network that links the buildings and consists of two or more local area networks (LANs) within the limited geographical area.
- It can be the college campus, enterprise campus, office buildings, military base, industrial complex.
- CAN is one of the type of MAN (Metropolitan Area Network) on the area smaller than MAN.

CANs (Campus Area Networks)



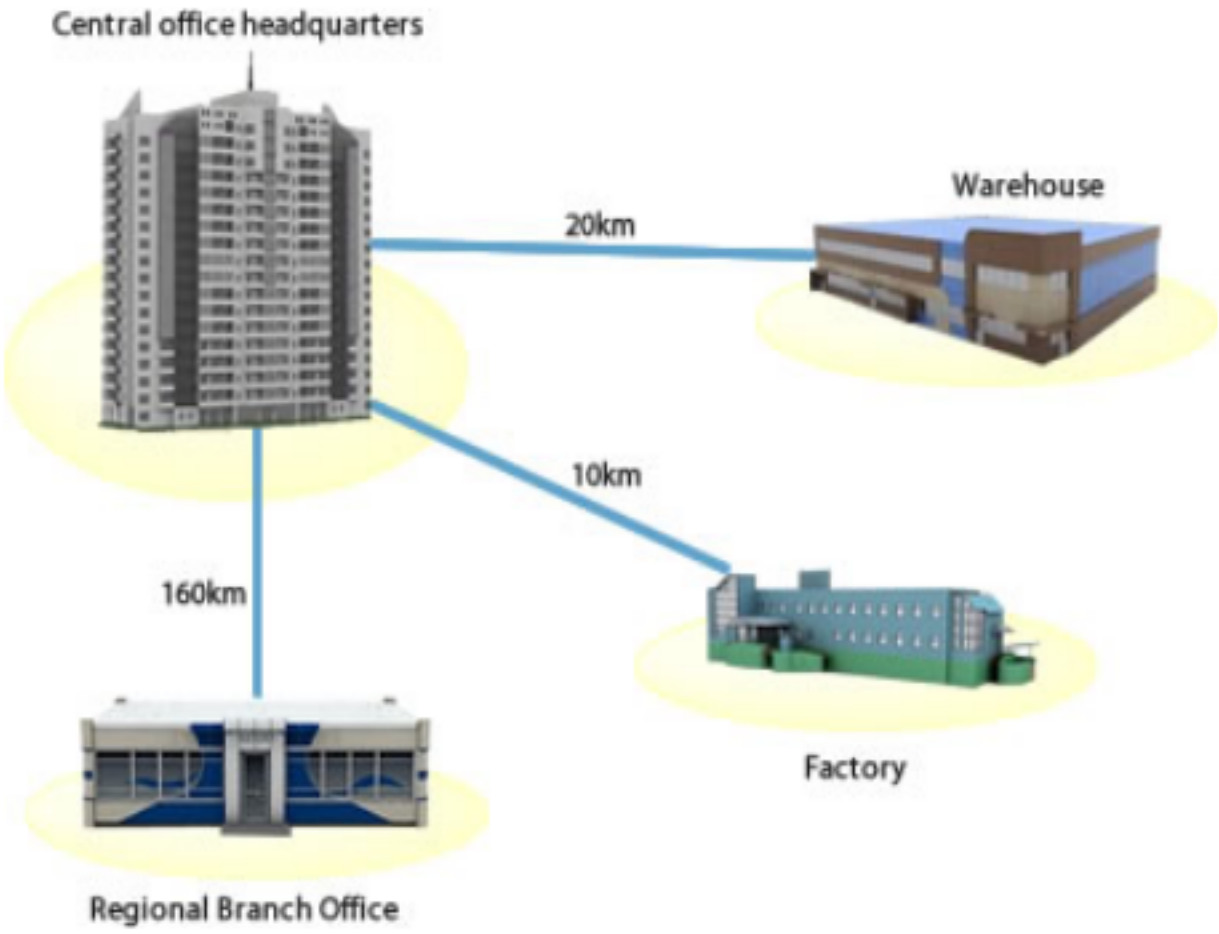
MANs (Metropolitan Area Networks)

- A **metropolitan area network** (**MAN**) is a large computer network that usually spans a city or a large campus.
- A MAN is optimized for a larger geographical area than a LAN, ranging from several blocks of buildings to entire cities.
- A MAN might be owned and operated by a single organization, but it usually will be used by many individuals and organizations.

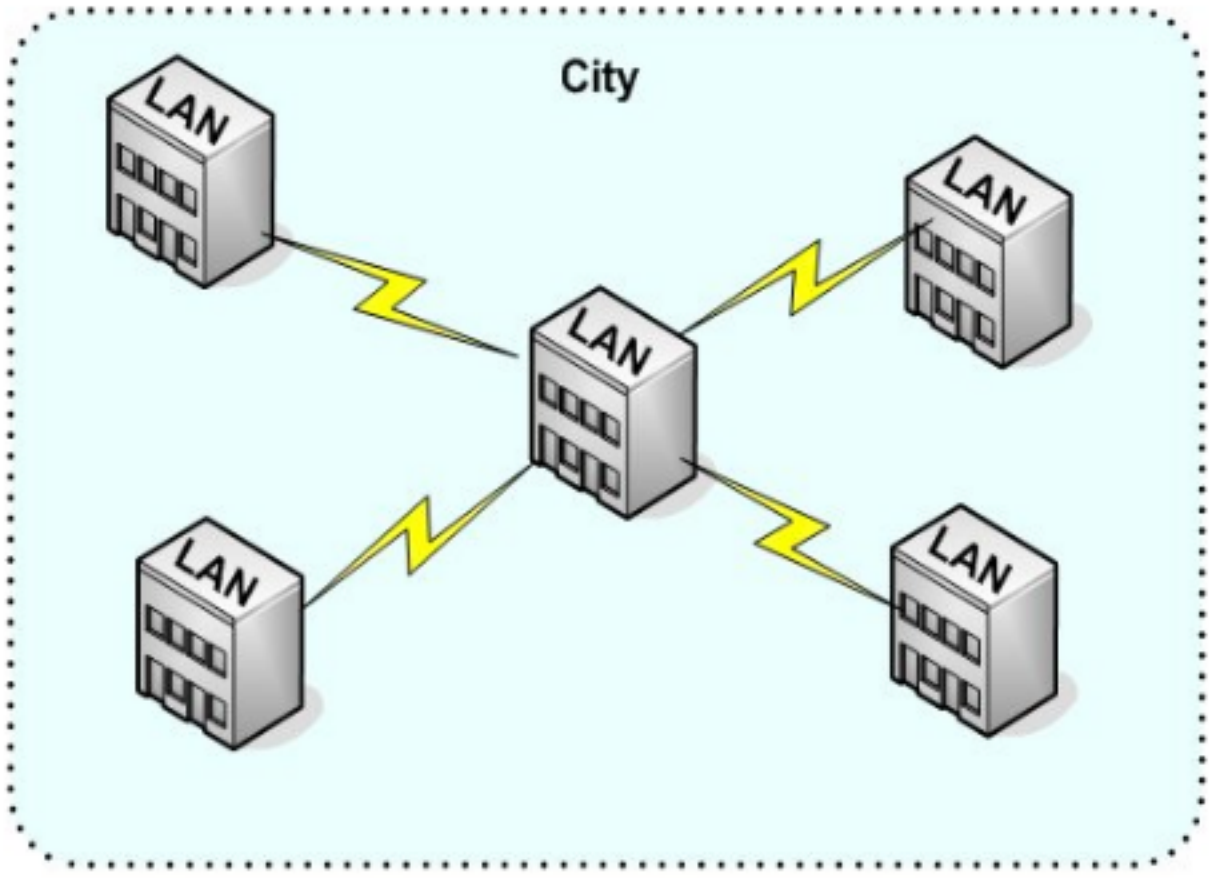
MANs (Metropolitan Area Networks)

- A MAN often acts as a high speed network to allow sharing of regional resources.
- A MAN typically covers an area of between 5 and 50 km diameter.

MANs (Metropolitan Area Networks)



MANs (Metropolitan Area Networks)

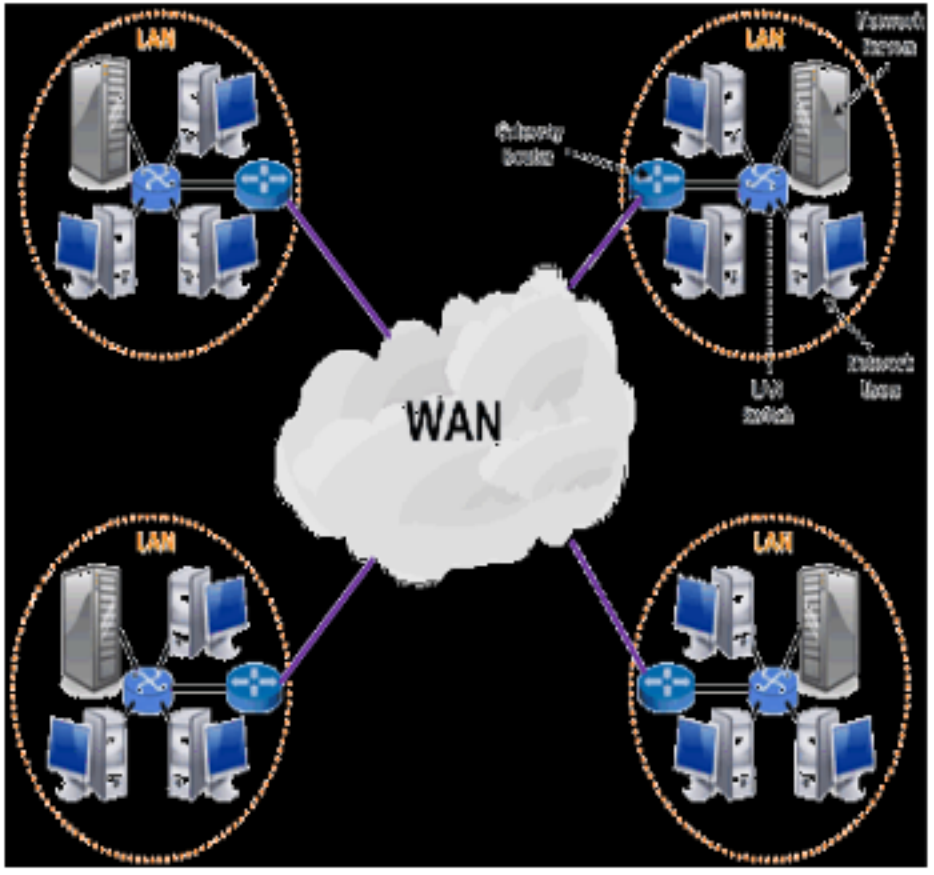


Metropolitan Area Network (MAN)

WANs (**Wide Area Networks**)

- WAN covers a large geographic area such as country, continent or even whole of the world.
- To cover great distances, WANs may transmit data over leased high-speed phone lines or wireless links such as satellites.
- The world's most popular WAN is the Internet.

WANs (**Wide Area Networks**)



What is the Internet?

- A worldwide, publicly accessible network of networks.
- When two or more networks are connected, they become an internet or internetwork.
- Business uses of the Internet:

  E-commerce

  Communications

  Collaboration and training

Evolution of the Internet

- Internet
  - Largest and most well-known computer network, linking millions of computers all over the world
  - The Internet has actually operated in one form or another for several decades
- ARPANET
  - The predecessor of the Internet
- Created in 1969 and named after the Advanced Research Projects Agency (ARPA), which sponsored its development
  - Initially connected four supercomputers; eventually evolved into today's Internet

Evolution of the Internet

- The World Wide Web
  - The collection of Web pages available through the Internet
  - Proposed by Tim Berners-Lee in 1989
  - Originally only text-based content; release of the Mosaic browser in 1993 led to graphical content
  - Web 2.0
- Wide variety of content available via Web pages today such as social networking, RSS, podcasts, blogs and wikis
  - The World Wide Web and the Internet are not owned by any person, business, or organization

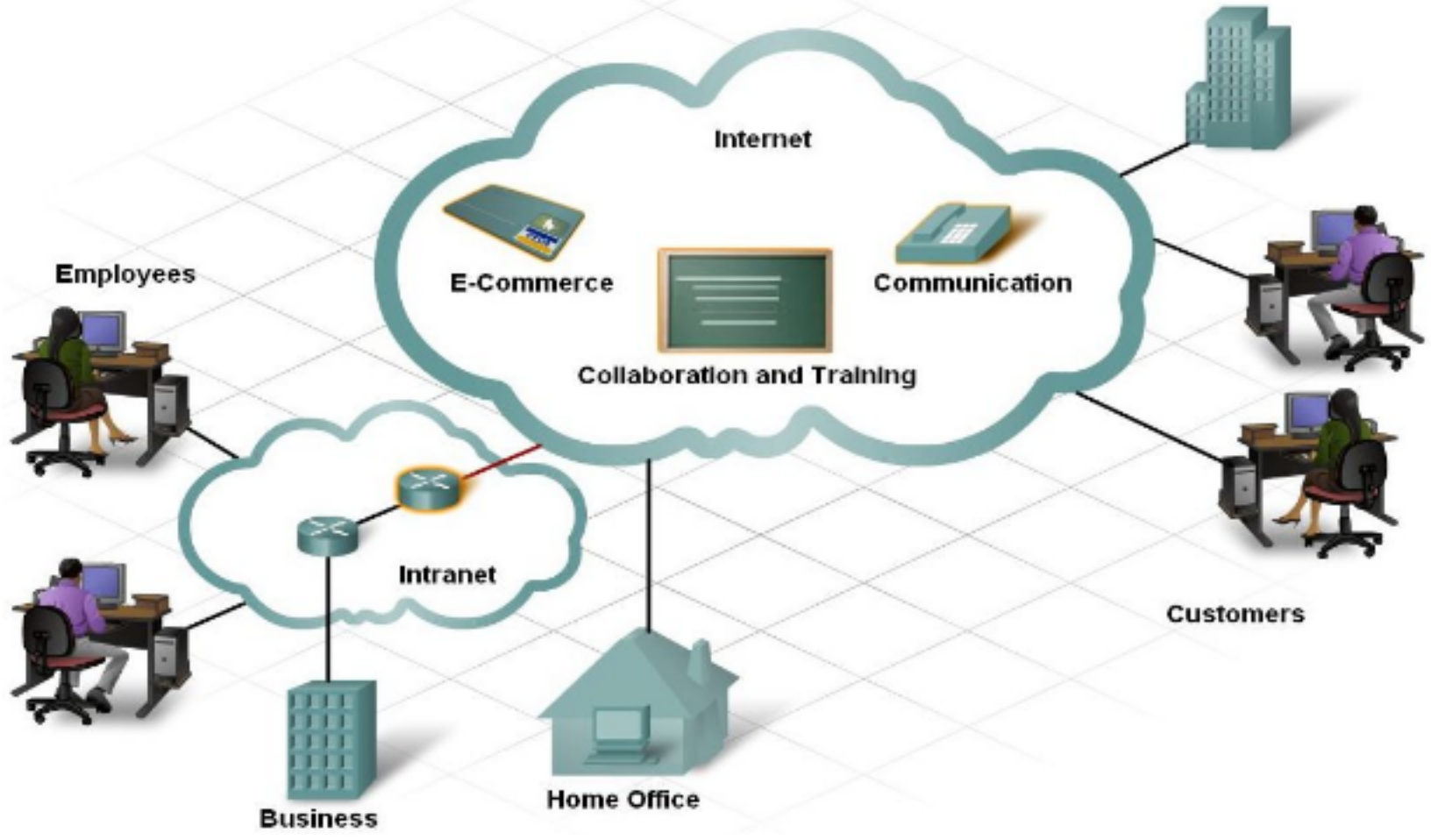
Evolution of the Internet

– Primary infrastructure that makes up the Internet backbone is typically owned by communications companies

- Internet2
  - Consortium of researchers, educators, and technology leaders from industry, government, and the international community
  - Dedicated to the development of revolutionary Internet technologies

– Research and development tool, much of which is focused on speed

Uses of the Internet



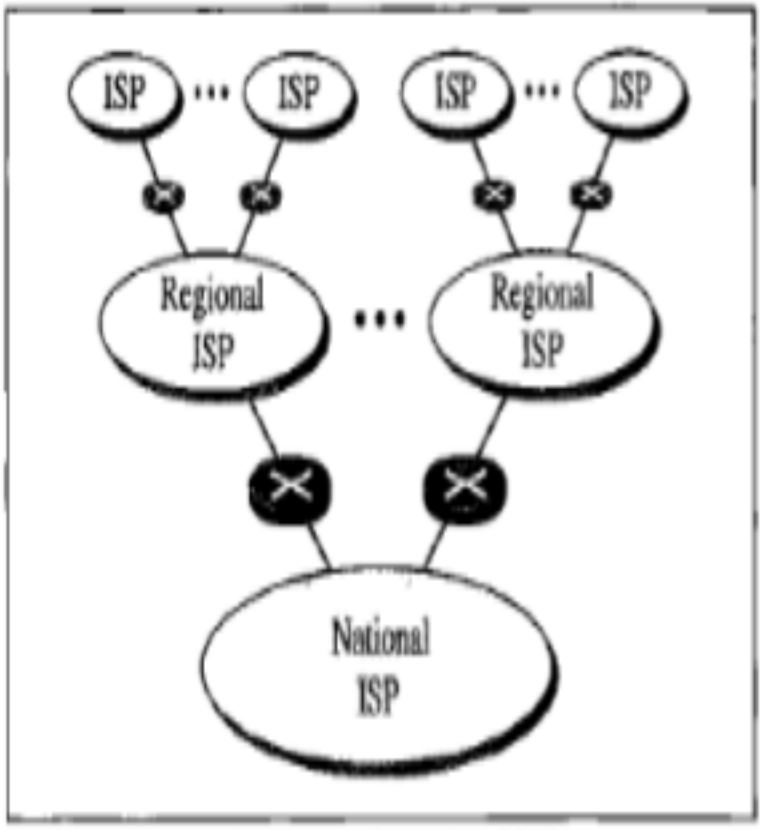
INTERCONNECTION OF NETWORKS: INTERNET

- As the Internet continue to grow, the number of users increases explosively day to day, today, it is very rare to see a LAN, a MAN or a WAN in isolation; they are connected to one another.
- In recent years, network has grown vastly with an interconnection of various networks spanning vast geographical locations linking together over millions of end-users known as the Internet.

INTERCONNECTION OF NETWORKS: INTERNET

- Services are provided by hierarchical ISPs (Internet Service Providers) who connects intending users.
- There are international service providers, national service providers, regional service providers and local service providers.
- The internet today is run by private companies, not government.

INTERCONNECTION OF NETWORKS: INTERNET



a. Structure of a national ISP

SERVICES OF INTERNET

- E-mail: Sending and receiving mail electronically.
- File Transfer: Transferring files from one computer to another. 3. WWW (World Wide Web): Retrieving information residing on the internet servers in the form of websites.
- Chat: Exchanging views or communicating information instantly.

APPLICATIONS OF INTERNET

1) On-line communication:

- Computer users around the world use the E-mail services to communicate with each other extensively.

2) Feedback about products:

- Commercial organizations are also using the internet to gather information about the satisfaction of existing products and market opportunities of new products.
- This is usually accomplished by putting up an interactive survey application by the organization on a WWW site on the Internet.

3) Product promotion:

- Several commercial organizations are effectively using the internet services for promoting their products by the use of different social networks.

APPLICATIONS OF INTERNET

4) Customer Support Service:

- Many organizations are also using the internet to provide timely customer support.

5) On-line shopping:

- The Internet has also facilitated the introduction of a new market concept, which consists of virtual shops. These shops remain open 24 hrs all the year round and are accessible to make purchase all around the world.

6) On-line journals and magazines:

- There are many WWW sites on the internet, which consists of an electronic version of many journals and magazines.

APPLICATIONS OF INTERNET

7) Real-time updates:

- It helps to provide news and other happenings that may be on-going in different parts of the word but with the use of the internet, we come to know about the real-time updates in every field be it in business, sports, finance, politics, entertainment and others very easily.
- Many time the decisions are taken on the real-time updates that are happening in the various parts of the world and for this, the internet is very essential and helpful.

8) Research:

- In order to do research, we need to go through hundreds of books as well as the references and that was one of the most difficult jobs to do earlier.
- Since, the internet came into life, everything is available in just a click. The user just has to search for the concerned topic and will get hundreds of references that may be beneficial for the research and since, the internet is here to make research activity easy and hence, public user can take a large amount benefit from the research work that have been done.

Significant global impacts of the Internet today

- Globalization of economies
- Cultural exchange and diversity
- Revolutionizing education
- Political influence and movements
- Economic opportunities
- Advancements in science and research
- Improved disaster response
- Digital divide and inequality
- Environmental awareness and action
- Cybersecurity and global threats